Brit. J. vener. Dis. (1970) **46**, 398

Treatment of acute gonococcal urethritis with three drug regimes

In 768 males, Brisbane, Queensland, 1967-69

B. A. SMITHURST

Department of Social and Preventive Medicine, University of Queensland, Australia

There is an extensive world literature on the problem of strains of *N. gonorrhoeae* which are increasingly resistant to treatment with penicillin; two recent publications (Morrison, Cobbold, Bor, Spitzer, Foster, and Willcox, 1968; Willcox, 1968) give a comprehensive review of the problem. Apart from the papers of Wren (1967) and Smith and Levey (1967) there have been few reports from Australian sources of the results of treating gonorrhoea with penicillin or tetracycline. The present communication gives the experience over a 2-year period of the treatment of males in Brisbane with penicillin and tetracycline. Brisbane, the fourth largest city and fourth largest port in Australia (population 777,674), is the capital of Queensland (population 1,732,280) (Solomon, 1969). Altogether 1,136 males were treated for gonorrhoea during this period, but 368 patients did not return after the second day of treatment and cannot therefore be included in the results, although clinical experience suggests that they were probably cured. These defaulters have, however, been included in the sociological data below.

Characteristics of population studied

COUNTRY OF ORIGIN

This is shown in Table I for the whole series of 1,136 cases.

AGE

There were 280 patients between 15 and 19 years, 400 between 20 and 24 years, 191 between 25 and 29 years, 154 between 30 and 39 years, 107 between 40 and 60 years, and four over 60 years of age.

MARITAL STATUS

The great majority (937) stated that they were single, 159 were married, and forty were separated or divorced.

HISTORY OF VENEREAL DISEASE (GONORRHOEA OR SYPHILIS)

There was no previous history in 747 patients; 277 had had gonorrhoea once, 62 gonorrhoea twice, 25 three times, 15 four times, and 7 five times or more. Three stated that they had had twelve to fifteen previous episodes of gonorrhoea.

Ten patients also gave a history of syphilis.

TABLE I *Country of origin of* 1,136 *patients*

Australia		814
United Kingdom (England 49, Scotland 30, Ireland 4)		83
New Zealand		19
South Africa		2
Other European		
Italy		38
Greece		25
Germany and Austria		24
Yugoslavia		20
Sweden, Denmark, Finland, Norway, Switzerland		32
Russia, France, Belgium	(1 each)	3
Holland		10
Poland		9
Baltic States		8
Hungary		4
Middle East		6
Asian		
Hong Kong		8
China		4
Ceylon, Indonesia, India	(1 each)	3
Unspecified		24
Total		1,136

Characteristics of disease

INCUBATION PERIOD

The average incubation period was 6 days.

SOURCE OF INFECTION

The majority of patients (1,014) stated that they had contracted the infection from a female who was not a prostitute in the accepted legal sense (a person who demanded money or solicited for custom); 66 stated that they had had contact with a prostitute, 42 with their wives, and twelve with a male. Two patients denied having had any sexual contact at all.

SYMPTOMS BEFORE TREATMENT

The symptoms of dysuria and/or discharge had been present for 1 to 3 days in 838 cases, 4 to 7 days in 223

Received for publication December 11, 1969

cases, 8 to 14 days in 47 cases, 15 to 21 days in thirteen cases, and over 21 days in fifteen cases.

Method of investigation of a suspected case of gonorrhoea

(1) A urethral smear was stained with 1 per cent. methylene blue in the clinic and a matching smear was examined with Gram stain in the State Health Laboratory. A culture of the discharge was not usually made except in certain cases found to be unresponsive to treatment (see below).
(2) Serological tests (Quantitative Kolmer, V.D.R.L., and Reiter protein complement-fixation) for syphilis were performed on three occasions: on presentation, after 6 weeks, and at 3 months after presentation.

Management of proven cases of gonorrhoea

Three regimes were used at the Brisbane Venereal Disease Clinic between 1967 and 69.

(1) 2 to 2·4 m.u. aqueous procaine penicillin G in two equal doses at an interval of 24 hours, combined with 2 g. probenecid given in one dose of 1 g. immediately and two doses of 0·5 g. after 8 and 16 hours respectively.
(2) 3 m.u. aqueous procaine penicillin G in two equal doses at an interval of 24 hours combined with 2 g. probenecid given as above.
(3) Tetracycline by mouth in doses of 5 to 10 g. over 5 days. Tetracycline was used only for those who gave a history of allergy to penicillin.

Criteria for cure

The cessation of the urethral discharge within the first week, preferably within the first 24 hours after treatment, together with a negative two-glass urine test, was considered to be clinical evidence of cure. If there was a persistent discharge this was examined microscopically for *N. gonorrhoeae,* and if the organisms were not present patients were classified as cases of post-gonococcal urethritis during the first week after treatment. In the majority of cases post-treatment signs were limited to a slight mucoid discharge which cleared in 2 to 3 days. The persistence of urethritis after a week was considered to indicate non-specific urethritis if *N. gonorrhoeae* were absent from a Gram-stained smear. After the first follow-up examination, patients were reviewed at 2, 3, and 4 weeks, and 2 months or over. All patients who admitted possible risk of reinfection were excluded from the series, although it was clearly impossible to be sure that some patients who stated that they had not had further intercourse were telling the truth. Prostatic massage was not performed and the urethral discharge was not cultured unless gonococci were found on Gram-stained smears.

Results

Of the 768 patients who returned for observation, 562 had been given 3 m.u. aqueous procaine penicillin G with 2 g. probenecid, 212 had received 2 to 2·4 m.u. aqueous procaine penicillin G with probenecid, and 94 had received 5 to 10 g. tetracycline. As already mentioned 368 patients did not return for follow-up. What proportion of these defaulters were seasonal itinerant workers, who form much of Queensland's work force, was not known.

These results are tabulated in Table II.

Discussion

There was no significant difference in the efficacy of the three treatment regimes used in Brisbane (P

TABLE II *Results of three dosage regimes in 768 patients who returned for observation*

Dosage	*Time of follow-up*	*No. followed*	*Result*		
			Satisfactory	*NGU*	*Suspected failures*
3 m.u. penicillin + 2 g. probenecid	1/52	52	18	13	21
	2/52	92	67	16	9
	3/52	26	14	7	5
	4/52	129	117	7	5
	2/12+	263	262	1	—
	Total	562	478	44	40 (7·1 per cent.)
2–2·4 m.u. penicillin + 2 g. probenecid	1/52	18	14	3	1
	2/52	7	4	1	2
	3/52	6	6	—	—
	4/52	43	36	—	7
	2/12+	138	137	—	1
	Total	212	197	4	11 (5·2 per cent.)
5–10 g. tetracycline	1/52	9	3	2	4
	2/52	8	6	1	1
	3/52	4	2	2	—
	4/52	29	28	1	—
	2/12+	44	44	—	—
	Total	94	83	6	5 (5·3 per cent.)

>0·5). A recent study in London (Morrison and others, 1968) showed that an injection of 2·4 m.u. penicillin G gave a failure rate of 5·8 per cent. in 240 cases of gonorrhoea in males. Holmes, Johnson, and Floyd (1967) reported a high success rate in curing 57 out of 58 sailors with gonorrhoea aboard U.S. Aircraft Carriers using 2·4 m.u. aqueous procaine penicillin G with 2·5 g. probenecid. Our reason for changing from 2·4 to 3 m.u. in Brisbane was the availability of syringes of aqueous procaine penicillin G each containing 1·5 m.u. The penicillin was first given in two equal doses with a 24-hour interval so as not to cause discomfort to the patient, but this procedure has now been abandoned in favour of one dose of 3 m.u. There is no room for complacency in the treatment of gonorrhoea in the male and the epidemiology of relatively insensitive strains of *N. gonorrhoea* isolated in the Brisbane V.D. Clinics will be presented in a further communication. Adequate criteria for cure (Gram-staining of discharge, 2-glass urine test, and culture where indicated) were employed in all cases and it would be fair to say that many of the cases of post-gonococcal urethritis seen in the first week were patients with a minimum of symptoms. 'Suspected failure' meant that there was definite persistence of *N. gonorrhoeae* in the post-treatment urethral discharge, but that because of doubts about re-infection it could only be suspected that it was the same organism which had not been eliminated by treatment. The use of 3 m.u. aqueous procaine penicillin plus 2 g. probenecid is now the routine practice in the clinic.

Summary

In Brisbane, Australia, 1,136 men with gonorrhoea were treated either with penicillin combined with probenecid or with tetracycline. Of 768 patients who were followed, 562 had received 3 m.u. aqueous procaine penicillin combined with 2 g. probenecid and the failure rate was 7·1 per cent.; 212 had received 2 or 2·4 m.u. procaine penicillin with 2 g. probenecid and the failure rate was 5·2 per cent.; 94 men allergic to penicillin were treated with 5 or 10 g. tetracycline given orally over 5 days and the failure rate was 5·3 per cent. There was thus no statistically significant difference between the results. 3 m.u. procaine penicillin plus 2 g. probenecid has now been adopted as routine therapy.

I should like to thank Dr. P. R. Patrick, Director-General of Medical Services, Queensland, for permission to publish this article.

References

HOLMES, K. K., JOHNSON, D. W., and FLOYD, T. M. (1967) *J. Amer. med. Ass.*, **202**, 461

MORRISON, G. D., COBBOLD, R. J. C., BOR, S., SPITZER, R. J., FOSTER, D. N., and WILLCOX, R. R. (1968) *Brit. J. vener. Dis.*, **44**, 319

SMITH, D. D., and LEVEY, J. M. (1967) *Med. J. Aust.*, **1**, 849

SOLOMON, S. E. (1969) 'Queensland Pocket Year Book'. Commonwealth Bureau of Census and Statistics.

WILLCOX, R. R. (1968) *Curr. Probl. Derm.*, **2**, 101

WREN, B. G. (1967) *Med. J. Aust.*, **1**, 847

Traitement de l'urétrite gonococcique aigüe selon trois schéma thérapeutiques chez 768 hommes en Brisbane, Queensland, 1967-69

SOMMAIRE

En Brisbane, Australie, 1.136 hommes atteints de gonococcie furent traités soit par la pénicilline associée au probénecid, soit avec la tétracycline. Parmi les 768 malades suivis, 562 avaient reçu 3 m.u. de pénicilline procaïne en suspension aqueuse combinée à 2 g. de probénecid: la proportion d'échecs fut de 7,1%. 212 malades avaient reçu 2 ou 2,4 m.u. de pénicilline-procaïne avec 2 g. de probénecid: le taux d'échec fut de 5,2%. 84 hommes allergiques à la pénicilline furent traités avec 5 ou 10 g. de tétracycline *per os* donnés en 5 jours: le taux d'échecs fut de 5,3%. Ainsi il n'y eut pas de différence statistique significative entre ces résultats. Trois m.u. de pénicilline-procaïne plus 2 g. de probénecid a maintenant été adopté en thérapeutique routinière.